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Original contribution

An automated high-throughput assay for survival of the nematode *Caenorhabditis elegans*

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Abstract

Many genetic or environmental manipulations that extend life span in the nematode *Caenorhabditis elegans* (*C. elegans*) also enhance survival following acute stresses such as oxidative damage and thermal stress. This coupling of stress response and aging mechanisms has proved a useful tool in identifying new genes that affect the aging process without the need for performing lengthy life span analyses. Therefore, it is likely that this approach may also be applied to the identification of pharmacological agents that extend life span through enhanced resistance to oxygen radicals or other stressors. To facilitate high-throughput drug screens in the nematode, we have developed a microtitre plate survival assay that uses uptake of the fluorescent dye SYTOX green as a marker of nematode death. An increase in throughput compared with the conventional survival assay was achieved by combining automated worm-handling technology with automated real-time fluorescence detection. We have validated this assay by examining survival during acute heat stress and protection against oxidative stress with the superoxide dismutase/catalase mimetic Euk-134. We propose that this novel method of survival analysis will accelerate the discovery of new pharmacological interventions in aging and oxidative stress.

Keywords: *C. elegans*, Aging; Life span; Survival; Superoxide dismutase/catalase mimetic; Compound screen; Free radicals

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